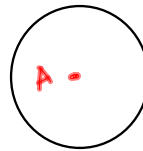


# Ch 10 Circles

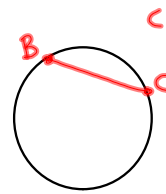
## 10-1 Use Properties of Tangents

### 10-2 Find Arc Measures



Circle--the set of all points in a plane equidistant from a given point

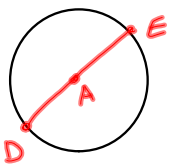
Center--given point



Circle A

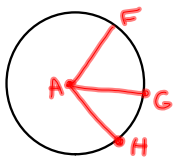
Chord--segment whose endpoints are on the circle

$\overline{BC}$

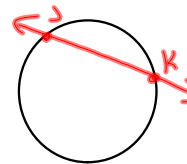


Diameter--chord that passes through the center

$\overline{DE}$



Radius--segment whose endpoints are the center and a point on the circle

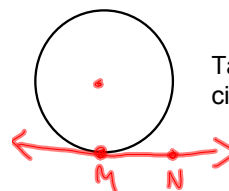


Secant--line that contains a chord; intersects the circle in two points

$\overleftrightarrow{JK}$

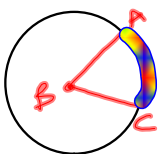
$\overline{JK}$

chord



Tangent--line that intersects the circle in exactly one point

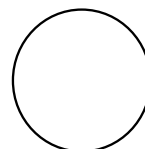
$\overleftrightarrow{MN}$



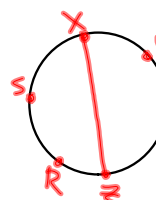
Central Angle--Angle whose vertex is the center and whose sides are radii.

Central angle intercepts an arc.

$\angle ABC$  intercepts  $\widehat{AC}$



Arc--part of the circle



Minor Arc--  $< 180^\circ$

2 letters

Major Arc--  $> 180^\circ$

3 letters

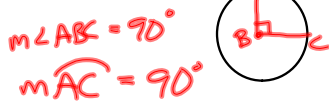
Semicircle--  $180^\circ$

3 letters

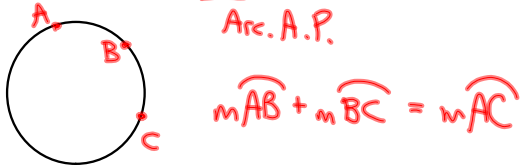
$\widehat{XYZ}$

$\widehat{XSZ}$

Measure of the central angle = measure of the intercepted minor arc

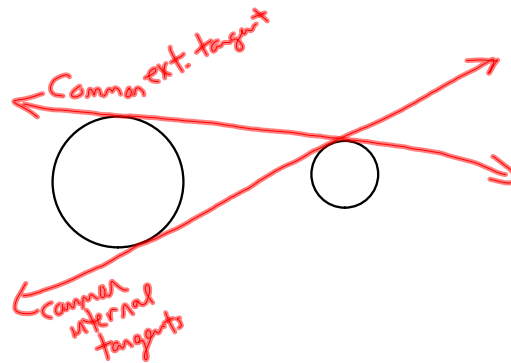
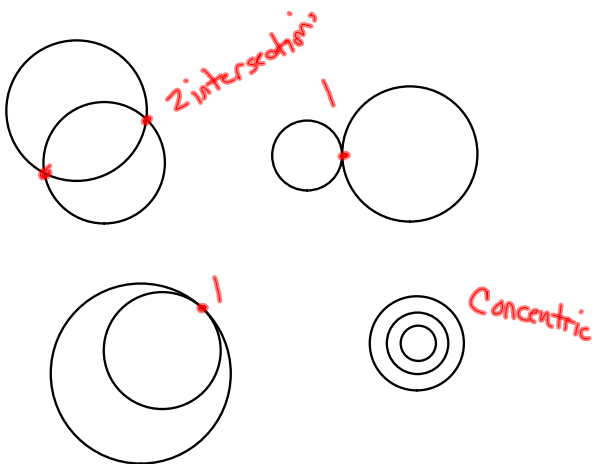
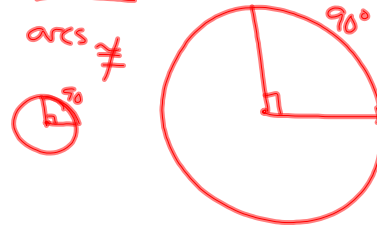


Postulate 23--Arc Addition Postulate--

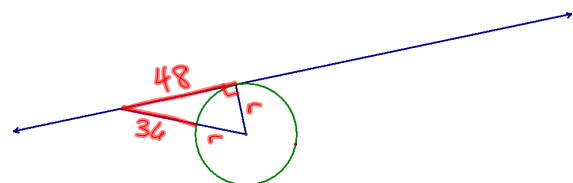
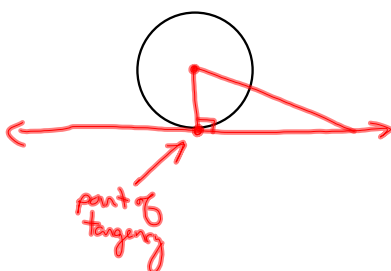


Congruent circles--circles with the same radius

Congruent arcs--arcs with the same measure that are in the same circle or congruent circles

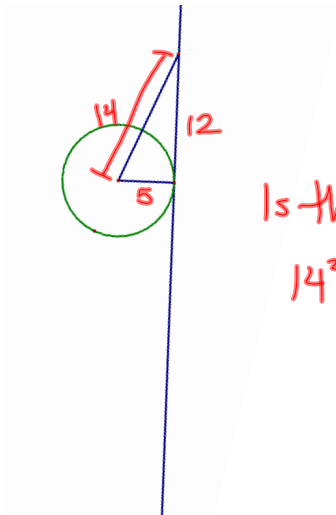


Theorem 10.1--In a plane, a line is tangent to a circle iff the line is perpendicular to a radius of the circle at its endpoint on the circle



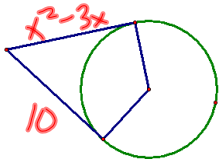
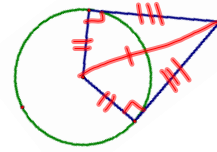
What is the radius?

$$\begin{aligned}(r+36)^2 &= r^2 + 48^2 \\ r^2 + 72r + 1296 &= r^2 + 2304 \\ 72r &= 1008 \\ r &= 14\end{aligned}$$



Is this tangent?  
 $14^2 \neq 5^2 + 12^2$   
 No

Theorem 10.2--Tangents from the same external point are congruent.

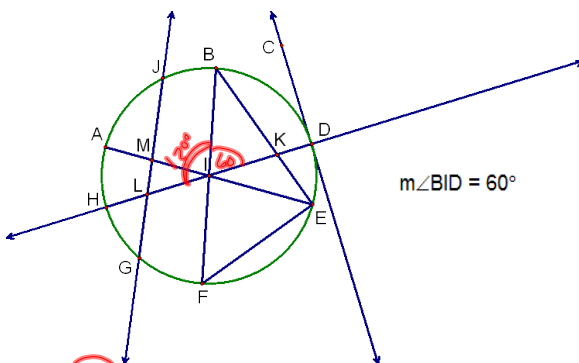
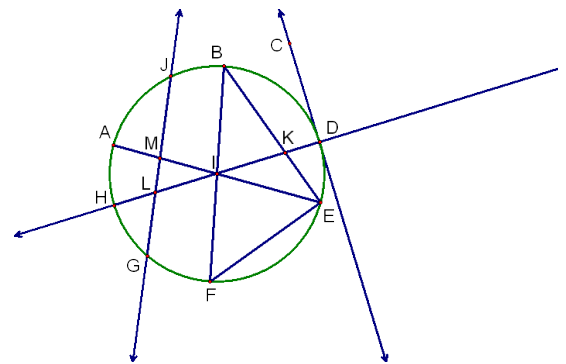


$$x^2 - 3x = 10$$

$$x^2 - 3x - 10 = 0$$

$$(x - 5)(x + 2) = 0$$

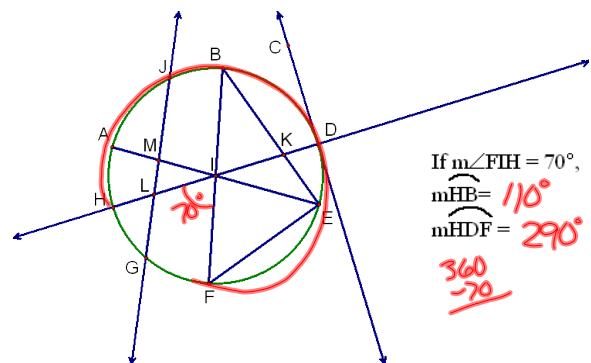
$$x = 5 \quad x = -2$$



$$m\angle BID = 60^\circ$$

$$m\widehat{BD} = 60^\circ$$

$$m\widehat{AH} = 120^\circ$$

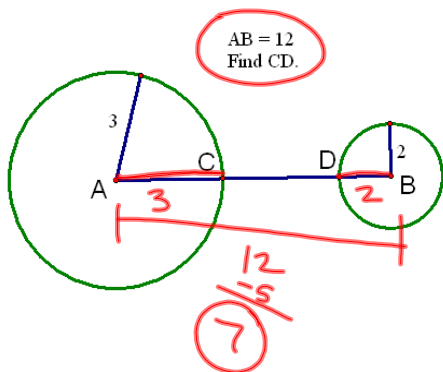
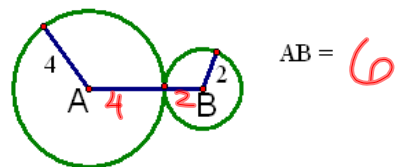
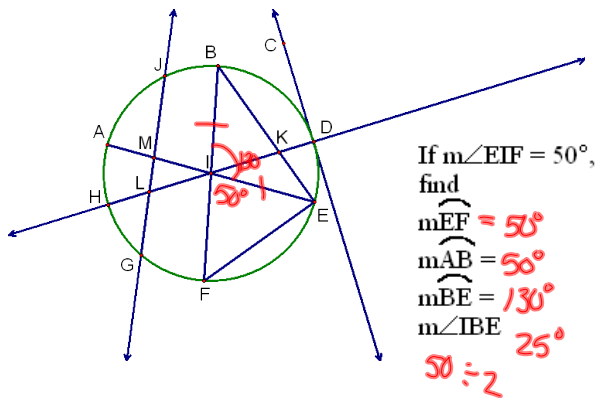
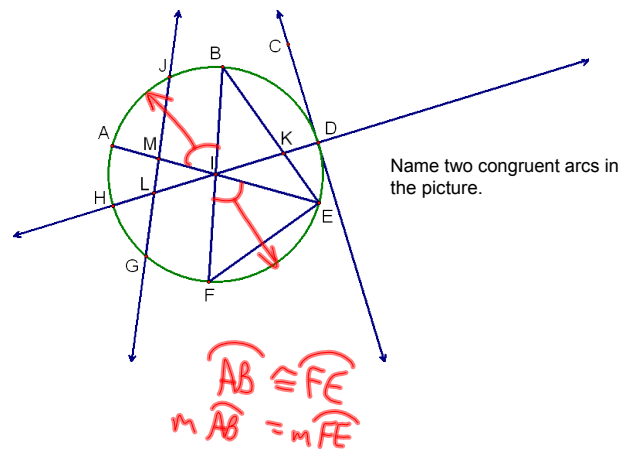
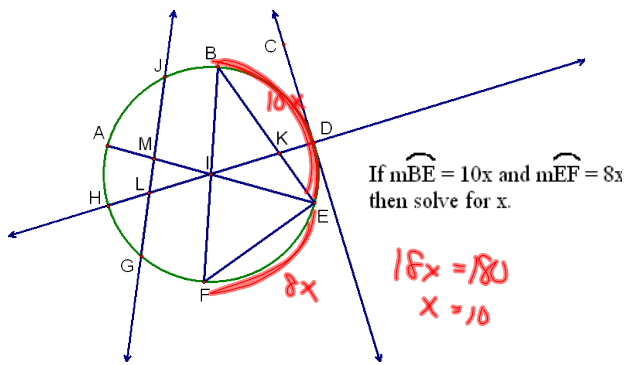


$$\text{If } m\angle FIH = 70^\circ,$$

$$m\widehat{HB} = 110^\circ$$

$$m\widehat{HDF} = 290^\circ$$

$$360 - 70$$



HW  
p655-657  
#s 3-10, 15-22, 25  
p661-662  
#s 3-10, 21 (hint sohcahtoa)

Find each measure.

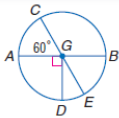
14.  $m\angle CGB$

16.  $m\angle AGD$

18.  $m\angle CGD$
15.  $m\angle BGE$

17.  $m\angle DGE$

19.  $m\angle AGE$

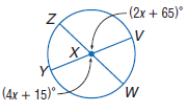


ALGEBRA Find each measure.

20.  $m\angle ZXV$

22.  $m\angle ZXY$
21.  $m\angle YXW$

23.  $m\angle VXXW$



ALGEBRA In  $\odot Z$ ,  $\angle WZX \cong \angle XZY$ ,  $m\angle VZU = 4x$ ,  $m\angle UZY = 2x + 24$ , and  $\overline{VY}$  and  $\overline{WU}$  are diameters. Find each measure.

32.  $m\widehat{UY}$

34.  $m\widehat{WX}$

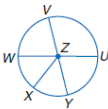
36.  $m\widehat{WUY}$

38.  $m\widehat{XVY}$
33.  $m\widehat{WV}$

35.  $m\widehat{XY}$

37.  $m\widehat{YVW}$

39.  $m\widehat{WUX}$



The diameter of  $\odot C$  is 32 units long. Find the length of each arc for the given angle measure.

40.  $\widehat{DE}$  if  $m\angle DCE = 100$

42.  $\widehat{HDF}$  if  $m\angle HCF = 125$
41.  $\widehat{DHE}$  if  $m\angle DCE = 90$

